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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,489	03/07/2002	Shinichi Nakabayshi	501.41263X00	9472
20457	7590	10/20/2003	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-9889			LE, DUNG ANH	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 10/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/091,489	NAKABAYSHI ET AL.	
	Examiner	Art Unit	
	DUNG A LE	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25-28 is/are allowed.
- 6) ☒ Claim(s) 1-9, 16-20, 23, 24 and 30-35 is/are rejected.
- 7) ☐ Claim(s) 12-15, 21 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 March 2002 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |



DETAILED ACTION

Priority

Acknowledge is made of applicants' claim for foreign priority base on an application 2001-121642 filed in Japan on 04/19/02.

It is noted that Applicants have filled a certified copy of said application as required by U.S.C 119, which papers have been placed of record in the file.

Oath/Declaration

The oath/declaration filed on 3/7/2002 is acceptable.

Specification

The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

Claim 1 is objected to because of the following informalities:

In claim 1, change "the stable particle dispersion state" to -- a stable particle dispersion state --

Claim Rejections

Set of claims 1- 15

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1- 4 and 9 are rejected under 35 USC 102 (b) as being anticipated by Kaufman et al. (5954997).

Kaufman et al. disclose a fabrication method of a semiconductor integrated circuit device comprising the steps of:

- (a) preparing a polishing slurry in the stable particle dispersion state (col 4, line 10-15);
- (b) diluting said polishing slurry with a water solution, which has deionized water as a main component (col 4, lines 20-23); and
- (c) supplying the polishing slurry on the surface of the wafer undergoing the mass-production process immediately after being diluted with said water solution to apply the

chemical-mechanical polishing method (col 4, lines 30-35).

Regarding claims 2, 3 and 4 wherein said polishing slurry in the stable particle dispersion state contains 11-15 weight % silica, wherein said polishing slurry in the stable particle dispersion state contains 11-13 weight % silica and the stable particle dispersion state; , wherein said polishing slurry in the stable particle dispersion state contains 12 weight % silica. (col 4, lines 10-15).

Regarding claim 9, wherein the pH value of said polishing slurry in the stable particle dispersion state is 10.5-11.5.(col 8, line 24).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5- 8 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Kaufman et al. in view of the following remark.

Kaufman et al. discloses the claimed invention as applied to claim 1, except for wherein a mixture ratio of said polishing slurry and said water solution is 1 (polishing slurry): 1-1.2 (water solution), wherein after said polishing slurry is diluted with said

water solution, it is supplied on the surface of said wafer to be polished within 10-15 seconds, wherein after said polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be polished within two hours, wherein after said polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be polished within ten minutes and , wherein after said polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be polished within 10-15 seconds as cited in present claims 5- 8.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to form polishing slurry and said water solution is 1 (polishing slurry): 1-1.2 (water solution), polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be polished within 10-15 seconds, polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be polished within two hours, polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be polished within ten minutes and , and polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be polished within 10-15 seconds, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use .

Set of claims 16- 24.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 16- 24 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Kaufman et al. in view of the following remark.

Kaufman et al. show a fabrication method of a semiconductor integrated circuit device comprising the steps of:

- (a) preparing a polishing slurry containing 11-15 weight % of silica;
- (b) diluting said polishing slurry with a water solution or chemical solution, which has deionized water as a main component; and
- (c) supplying the polishing slurry on the primary surface of the wafer undergoing the mass-production process immediately after being diluted with said water solution or the said chemical solution, thereby applying the chemical-mechanical polishing method on the primary surface of said wafer (col 4, lines 10-35).

Kaufman et al. do not show applying the chemical-mechanical polishing method to form an insulating groove smoothed by polishing on the primary surface of said wafer.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to apply the chemical-mechanical polishing method to create an insulating groove smoothed by polishing on the primary surface of said wafer, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Regarding claims 17-20, Kaufman et al. discloses the claimed invention as applied to claim 16, except for wherein a mixture ratio of said polishing slurry and said water solution is 1 (polishing slurry): 1-1.2 (water solution), wherein after said polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be polished within 10-15 seconds, wherein after said polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be polished within two hours, wherein after said polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be polished within ten minutes and , wherein after said polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be polished within 10-15 seconds as cited in present claims 17- 20.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to form polishing slurry and said water solution is 1 (polishing slurry): 1-1.2 (water solution), polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be polished within 10-15 seconds, polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be

polished within two hours, polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be polished within ten minutes and , and polishing slurry is diluted with said water solution, it is supplied on the surface of said wafer to be polished within 10-15 seconds, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use .

Regarding claims 21 and 22, refer to Reasons for Indication of Allowable Subject Matter below.

Regarding claims 23 and 24, wherein said polishing slurry prepared in said step (a) contains 11-13 weight % silica and wherein said polishing slurry prepared in said step (a) contains 12-weight % silica. (col 4, lines 10- 15).

Set of claims 25- 28.

Regarding claims 25 and 28, refer to Reasons for Indication of Allowable Subject Matter below.

Set of claims 29-34.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 26, 34-35 are rejected under 35 USC 102 (b) as being anticipated by Kaufman et al. (5954997).

Kaufman et al. teach clearly a fabrication method of a semiconductor integrated circuit device comprising the steps of:

- (a) preparing the polishing slurry containing 11-15 weight % of silica; and
- (b) supplying said polishing slurry and said water solution made mainly of deionized water on the primary surface of the wafer undergoing the mass-production process to apply chemical-mechanical polishing (col 4, lines 10-35).

Regarding claims 34 and 35, wherein said polishing slurry prepared in said step (a) contains 11-13 weight % silica and wherein said polishing slurry prepared in said step (a) contains 12-weight % silica (col 4, lines 10-15).

Claims 30-33 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Kaufman et al. in view of the following remark.

Regarding claims 30-32, Kaufman et al. discloses the claimed invention as applied to claim 29, except for a mixture ratio of said polishing slurry and said water solution is 1 (polishing slurry): 1-1.2 (water solution), wherein the concentration of said coagulated silica particles with a diameter of 1 μm contained in said polishing slurry is 200,000/0.5 cc or less and , wherein said polishing slurry has been left at rest for 30 days or more beforehand as cited in claims 30-32.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to form a mixture ratio of said polishing slurry and said water solution is 1 (polishing slurry): 1-1.2 (water solution), the concentration of said coagulated silica particles with a diameter of 1 μm contained in said polishing slurry is 200,000/0.5 cc or less and said polishing slurry has been left at rest for 30 days or more beforehand, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use .

Regarding claim 33, Kaufman et al. do not show applying the chemical-mechanical polishing method to form an isolating groove smoothed by polishing on the primary surface of said wafer.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to apply the chemical-mechanical polishing method to

create an isolating groove smoothed by polishing on the primary surface of said wafer, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Reasons for Indication of Allowable Subject Matter

Claims 10- 12, 13-15 and 21-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, since the prior made of record and considered pertinent to the applicant's disclosure does not teach or suggest the claimed limitations. Kaufman et al. (U.S. Patent No. 5954997) and The Background of the Invention, taken individually or in combination, do not teach the claimed invention having (Regarding claims 10 and 21), wherein said polishing slurry in the stable particle dispersion state is used after it has been left at rest until the concentration of coagulated particles with a diameter of 1 .mu.m or more contained in it becomes 200,000/0.5 cc or less and (Regarding claims 13 and 22), wherein said polishing slurry in the stable particle dispersion state is used after it has been left at rest for 30 days or more.

Claims 25- 28 would be allowed.

The following is a statement of reason for the indication of allowable subject matter:

Claims 25- 28 are considered allowable since the prior made of record and considered pertinent to the applicant's disclosure does not teach or suggest the claimed limitations. Kaufman et al. (5954997).and The Background of the Invention, taken individually or in combination, do not teach the claimed invention having the steps of forming a groove in a element-isolating region of the primary surface of a wafer by etching the element-isolating region of primary surface of said wafer using a oxidation-resistant insulating film formed over the primary surface of said wafer as a mask; (b) forming a silicone oxide insulating film over the primary surface of said wafer including the inside of said groove.

If Applicants are aware of better art than that which has been cited, they are required to call such to attention of the examiner.

When responding to the office action, Applicants' are advice to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung A. Le whose telephone number is 703-306-5797. The examiner can normally be reached on Monday-Friday 8:00am-5: 30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on 703-308-4910. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Dung A. Le
Examiner 